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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Robert H Kirkby

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03/04/2009

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EXAMINER

YAARY, MICHAEL D

ART UNIT

PAPER NUMBER

2193

MAIL DATE

DELIVERY MODE

03/04/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/549,853	Applicant(s) KIRKBY, ROBERT H	
	Examiner MICHAEL YAARY	Art Unit 2193	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 December 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 and 11-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 and 11-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 December 2008 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-9 and 11-19 are pending in the application.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-9 and 11-19 rejected under 35 U.S.C. 103(a) as being unpatentable over Gerard (US Pat. 4,532,603) in view of Budisin (Efficient Pulse Compressor for Golay Complementary Sequences, Pages 219-220).

Budisin was cited in the previous office action dated 09/02/2008.

4. **As to claims 1 and 11**, Gerard discloses a method of matched filtering in accordance with a reference signal sequence comprising a plurality of signal samples at regular sampling time intervals λ (abstract and column 2, lines 41-64), said method comprising the use of apparatus to effect the following operations:

Receiving an input time domain signal $r(t)$ to be filtered, said signal $r(t)$ representing at least one physical characteristic of at least one tangible thing (column 1, line 63-column 2, line 6);

Sampling the input time domain signal $r(t)$, at sampling time intervals τ that are not synchronized to the sampling intervals λ of the reference signal sequence, to produce an input signal sequence (column 1, lines 51-62 and column 3, lines 24-51);

Computing the Fourier transform of the input signal to be filtered evaluated at discrete frequencies f determined by the intervals τ at which the input signaled is sampled (column 4, lines 14-29);

Computing the Fourier transform of the reference sequence, evaluated at the same discrete frequencies f (column 3, line 52-column 4, line 14);

Forming the product of the two Fourier transforms and computing the inverse Fourier transform of said product to produce an output time domain signal $y(t)$ representing a filtered version of the input time domain signal, now transformed to provide a more useful representation of said at least one physical characteristic of said at least one tangible thing (column 6, lines 48-59).

5. Gerard does not explicitly disclose the reference sequence is defined as a function of time by a process of iteratively combining shifted versions of shorter sequences, and computing the Fourier transform of the reference sequence comprises an iterative process of combining the Fourier transforms of shorter sequences.

However, Budisin discloses the reference sequence is defined as a function of time by a process of iteratively combining shifted versions of shorter sequences, and computing the Fourier transform of the reference sequence comprises an iterative

Art Unit: 2193

process of combining the Fourier transforms of shorter sequences (page 220, paragraphs 1-3).

6 Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Gerard by utilizing the sequence length teachings of Budisin, for the benefit of providing simple efficient correlation of sequences, such as in Golay pairs.

7. **As to claims 2 and 12**, the combination of Gerard and Budisin disclose the reference sequence is a Golay sequence pair (Page 220, paragraph 3) and the step of forming the Fourier transform of the reference sequence comprises repeatedly:

Combining the Fourier transform of a first member of a Golay pair with the Fourier transform of the second member of that Golay pair to produce a first member of a new Golay pair; and combining the Fourier transform of a first member of a Golay pair with the Fourier transform of the second member of that Golay pair to produce a second member of a new Golay pair (Budisin, Page 220, paragraphs 2-3).

8. **As to claims 3, 7, 13, and 17**, the combination of Gerard and Budisin disclose combining uses only the operations of inverting, addition, and multiplication by $\exp(\pm j2\pi f\Phi)$, where f is frequency and Φ is a shift value dependent on the length of the sequence (Budisin, Page 220, paragraph 3).

Art Unit: 2193

9. **As to claims 4, 5, 8, 9, 14, 15, 18, and 19**, the combination of Gerard and Budisin disclose the transforms $A_k(f)$, $B_k(f)$ of the Golay pair are formed from the transforms $A_{k-1}(f)$, $B_{k-1}(f)$ of a shorter such pair according to the relationships

$$A_k(f) := A_{k-1}(f)\exp(+j2\pi f\Phi) + B_{k-1}(f)\exp(-j2\pi f\Phi)$$

$$B_k(f) := A_{k-1}(f)\exp(-j2\pi f\Phi) + B_{k-1}(f)\exp(+j2\pi f\Phi)$$

Where Φ is half the length of each member of the shorter pair, and f is the frequency (Budisin, Page 219, all column 2).

10. **As to claims 6 and 16**, the combination of Gerard and Budisin disclose the iteration commences with a Golay pair each member of which has length of 1 (Budisin, Page 219, all column 2).

Response to Arguments

11. Applicant's arguments with respect to claims 1-9 and 11-19 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

Art Unit: 2193

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL YAARY whose telephone number is (571)270-1249. The examiner can normally be reached on Monday-Friday, 8:00 a.m - 5:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lewis Bullock can be reached on (571) 272-3759. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2193

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. Y./

Examiner, Art Unit 2193

/Lewis A. Bullock, Jr./

Supervisory Patent Examiner, Art Unit 2193